

## Critical Analysis Team Report on the Silos Project

### CAT Report #14

28 February 2000

The Critical Analysis Team (CAT) attended briefings at the Fernald Site February 8-10. The purpose was to update the CAT on the status of silos projects, with a particular focus on the Accelerated Waste Retrieval project. As such, the CAT offers the following observations made during the visit.

#### Accelerated Waste Retrieval (AWR)

In general, it appears that the AWR project teams (Foster Wheeler and Fluor Daniel Fernald) appear to be working well together with significantly improved communications. Both groups should strive to maintain this relationship. In reviewing the AWR schedule, the project appears to be progressing satisfactorily.

It seems that the AWR project has the potential for acceleration. Acceleration should result in significant cost savings, free up resources for other silos projects, and may facilitate acceleration of silos 1 and 2 treatment. This potential is most evident in the construction mobilization date as well as the length of retrieval operations.

Currently, the retrieval operation is scheduled to be completed by two shifts with a shutdown period each day. The CAT has commented in the past (CAT Report #13) that this approach should be changed to consider continuous operations, thus providing more process efficiency and accelerating the completion date. This acceleration concept is promising. The CAT recommends that acceleration efforts be pursued if they:

- Do not compromise safety.
- Can be accomplished within the silos project's budget authorization and funding profile.
- Have a positive effect on the overall silos project. That is, the AWR acceleration does not adversely impact either Silo 3 or the Silos 1 and 2 treatment effort.

The CAT urges Fluor Daniel Fernald (FDF) to prudently proceed with the project as baselined. However, continued evaluation of acceleration possibilities should be pursued.

The CAT is encouraged by FDF and Foster Wheeler efforts to better understand the impacts of bentonite on the retrieval system. The planned settling tests on both surrogates and K-65 material will provide important data critical to the project's success.

However, the CAT was hopeful that the tests would also include a piping loop to determine the pumping characteristics of the bentonite and understand the process control of the slurry system. Currently, the test plan does not include such a loop.

The CAT has not seen a test plan for the ultrafiltration process. Because of the importance of ultrafiltration in providing clean flush water, the CAT recommends that testing to confirm filtration performance be completed.

The CAT remains concerned about AWR's use of EMMA, especially the 90 foot tall tower. Areas of concern include: center of gravity, weight, personnel safety (OSHA), and movement of a massive structure (see CAT Report #13). The CAT is concerned that as the EMMA and bridge design evolves, additional safety and maintenance issues will arise. The solutions to these problems will likely make the bridge and EMMA structure more massive, complicated, cumbersome and costly.

An example of an evaluation that may decrease technical risk is found in CAT Report #13. In the report, based on a Foster Wheeler value engineering study (Document 624-P622-43) the CAT recommended a value engineering study on alternatives to utilization of the EMMA arm.

### Silo 3

Silo 3 is showing significant performance problems related to schedule and poor quality design documentation. This could be the result of lack of understanding of original bid requirements and expectations, management problems, lack of capable personnel, or inadequacies in the contractor's teaming process. In any case, almost one year has passed since the contract was signed; yet work accomplished to date represents only about 4 months of serious design work.

In August of 1998, the CAT recommended avoiding such difficulties through clear communication from the beginning of the project:

*At the time of the contract award, the engineering staffs of the contractor and FDF should have an initial in-depth project baseline meeting. This meeting should verify that the parties are in agreement concerning contractor/FDF communication, contract, scope of work, program direction and design approach. The more detail that can be agreed upon during this meeting, the better. FDF must clearly communicate its project requirements and expectations to obtain quality work from the contractor. Ideally, this meeting would aid in establishing an informal basis for continuing communications between the contractor and FDF throughout the contract (CAT Report #3, August, 1998).*

Rocky Mountain Remediation Services (RMRS), while accommodating and agreeable, have not been responsive. With a slow start on design (see CAT report #10, 15 September 1999; and Roal trip report, 27 October 1999) and continued problems on developing acceptable quality design documentation, the CAT recommends decisive action on the part of FDF. Immediate and direct discussion with RMRS, FDF, MK and BNFL senior managers should be held, corrective actions established, responsible parties identified and due dates established, hopefully no later than the end of February.

If RMRS is able to improve performance in the near term, FDF should implement the following actions:

- Develop an action plan for schedule recovery. RMRS' Silo 3 working schedule (date 2/3/00) indicates negative schedule float in several areas; Final Hazard Analysis Report, preliminary design package, procurement activities, consumables, and construction. Negative (or near negative) schedule float during preliminary design activities is of concern. Float should not be consumed in early phases of a project because of the difficulty in regaining schedule.
- Silo 3 should be identifying and maintaining an action item list (if one does not exist) similar to that maintained by AWR. The purpose of this list would be to identify items, assign responsibility and track open items/issues to closure.

The Silo 3 project should also be developing a backup plan if RMRS is unable to improve performance in the near future. This plan should consider other contractors as well as FDF self-performing the work.

## General Issues

The CAT is pleased with the work-to-date on Operational Readiness Review training. The training session dry run was well planned, comprehensive and organized. Some of the positive aspects of the effort include: (1) presentation of ORR training information to both FDF and the subcontractors; (2) identification of supporting documentation both at Fernald and the subcontractors; and (3) implementation of processes which will lead to successful ORR's. Overall, the ORR training effort seems to be on a sound footing. The Silos projects, including subcontractors, will need to be diligent in supporting the effort.

The CAT is not able to validate exactly how design review comments are being handled in the system. To ensure that comments are being properly resolved and transmitted to the contractor, the CAT recommends the silos project manager request a quality assurance audit of the design review process. The audit should include all of the silos projects to identify deficiencies as well as areas for improvement.

Over one year ago, the CAT identified the need for a well documented organizational infrastructure including roles, responsibilities, authorities and interfaces. Still, this does not exist.

Generally, a contractor is allowed the freedom to manage subcontractors within the respective cost and schedule of the project. This doesn't appear to be the case with the Silos project. Expenditure of any amount of contingency appears to require DOE approval. As a result, FDF's accountability is greatly reduced.

Each FDF project and project manager should have a contingency reserve under his/her authority. Silos project management should have overall contingency management accompanied by DOE oversight.

In pursuing acceleration opportunities, Fluor Silos management should have a discretionary budget (e.g. \$200,000) to support engineering/value engineering studies to evaluate alternatives that may reduce cost/schedule or technical risk. Such studies could be performed by FDF engineering, the contractor or as a cooperative effort between the two. Because of the relatively small budgetary requirements, and the importance of moving nimbly on analyzing alternatives, Silos should not require DOE permission or approval to perform such tasks.

## **Recommendations**

**Recommendation 14-1:** FDF should pursue potential acceleration opportunities in the silos project.

**Recommendation 14-2:** FDF should complete (or have FW complete) a pump test loop to determine the characteristics of bentonite in the slurry system as well as the ultrafiltration performance.

**Recommendation 14-3:** FDF should immediately conduct discussions with RMRS, MK and BNFL to establish Silo 3 corrective actions, identify responsible parties, and establish near term milestones.

**Recommendation 14-4:** FDF should develop a backup plan if RMRS is unable to improve performance in the near future.

**Recommendation 14-5:** The silos project manager should request a quality assurance audit of the design review process. The audit should include all of the silos projects to identify deficiencies as well as areas for improvement.

**Recommendation 14-6:** FDF Silos project should be given a contingency reserve under its authority. Each project manager should have authority over its respective contingency reserve.

**Recommendation 14-7:** FDF and/or Foster Wheeler should conduct a value engineering study analyzing potential backup alternatives to the use of EMMA.